

ASSIGNMENT 4

Textbook Assignment: "Engine Troubleshooting and Overhaul," and "Electrical Troubleshooting," pages 3-28 through 4-29.

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| <p>4-1. Piston ring clearance is measured at what position on the piston?</p> <ol style="list-style-type: none">1. Between the ring and the top of the groove2. Between the ring and bottom of the groove3. At the ends of the piston ring <p>4-2. Before starting a newly overhauled engine, you should make which of the following inspections?</p> <ol style="list-style-type: none">1. Check for proper fluid levels2. Make sure the linkages and electrical connections are correct3. Make sure there are no loose items lying about4. All of the above <p>4-3. Before initial start-up, you should make sure the emergency shutdown systems are operational.</p> <ol style="list-style-type: none">1. True2. False <p>4-4. Upon starting a newly overhauled engine, you must shut the engine down if no oil pressure is observed in what maximum number of seconds?</p> <ol style="list-style-type: none">1. 52. 103. 154. 30 <p>4-5. A newly rebuilt engine should be run with light loading for at least (a) how long, and (b) what number of miles?</p> <ol style="list-style-type: none">1. (a) 10 hours (b) 100 miles2. (a) 50 hours (b) 500 miles3. (a) 100 hours (b) 1,000 miles4. (a) 250 hours (b) 2,500 miles | <p>4-6. For supplying electrical current in present-day automotive equipment, the alternator is preferred over the conventional generator for which of the following reasons?</p> <ol style="list-style-type: none">1. Its usefulness in supplying current is limited only by its size2. It produces current that is fed to accessories without alternation3. Its larger size enables it to supply the additional power required4. It is small and can produce the power required for operating electrical accessories under nearly all conditions <p>4-7. In an alternator, the rotor does the same job as which of the following parts in a DC generator?</p> <ol style="list-style-type: none">1. The field coil and pole shoe2. The stator3. The armature4. The rectifier bridge <p>4-8. Alternator system stators connected in a "Y" produce lower voltage and higher current than delta-connected stators.</p> <ol style="list-style-type: none">1. True2. False <p>4-9. What device enables an alternator to produce direct current?</p> <ol style="list-style-type: none">1. A commutator2. A rotor3. A rectifier bridge4. A stator |
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4-10. The chemical composition of a diode rectifier allows current to do what within the diode?

1. To not flow at all
2. To flow in one direction only
3. To flow in both directions

4-11. In the automotive alternator using positive and negative silicon-diode rectifiers, a total of how many rectifiers of each type are required?

1. One positive and one negative
2. Two positive and one negative
3. Two positive and two negative
4. Three positive and three negative

IN ANSWERING QUESTION 4-12, REFER TO FIGURE 4-2 IN YOUR TRAMAN.

4-12. The polarity of silicon-diodes that are not marked with plus or minus signs is marked with what color(s) of lettering?

1. Copper or silver
2. Blue or green
3. Black or red
4. Brown or yellow

4-13. Which of the following types of regulators is used in an alternator?

1. Transistorized
2. Electromagnetic
3. Transistor
4. Each of the above

4-14. You can adjust the transistor regulator internally by using which of the following procedures?

1. Relocating a screw in the base of the regulator
2. Turning a screw on the potentiometer
3. Interchanging diode connections
4. Sliding the contacts of its resistors

4-15. In troubleshooting a charging system, the mechanic observes that the generator field coils are grounded externally at the regulator. What type of field circuit will the mechanic be testing?

1. "A" circuit only
2. "B" circuit only
3. "A" or "B" circuit, depending on whether the system is positively or negatively grounded

4-16. The output polarity of a dc generator is determined by the polarity of its

1. "A" circuit
2. "B" circuit
3. permanent field pole piece
4. silicon-diode

IN ANSWERING QUESTIONS 4-17 THROUGH 4-27, WHICH DEAL WITH TROUBLESHOOTING A VEHICLE'S CHARGING SYSTEM WITH A VOLT-AMPERE TESTER, REFER TO FIGURES 4-8 THROUGH 4-14 IN YOUR TRAMAN.

4-17. During an alternator output test, the ammeter scale indication stays at normal while engine speed is increased slowly. Which of the following components needs to be replaced?

1. The alternator
2. The battery
3. The regulator

4-18. The ammeter shows no output at high voltage during a generator test, and the charging circuit is not fused at the regulator. What component should be repaired or replaced?

1. The field lead of the wiring harness
2. The armature lead of the wiring harness
3. The regulator cutout relay
4. The generator field winding

- 4-19. While testing a 12-volt charging system, the mechanic gets a maximum voltmeter reading of 15 volts. What is the probable cause of this reading?
1. A blown fuse
 2. A shorted field wire
 3. A grounded field
 4. A defective regulator current limiter relay
- 4-20. You are testing a vehicle's voltage regulator. A voltage output that is either too high or too low can be caused by which of the following troubles?
1. A damaged regulator resistor
 2. A faulty regulator voltage limiter
 3. Burned regulator contacts
 4. Each of the above
- 4-21. By measuring the resistance of a negative charging system circuit, you can determine how much voltage is lost between which of the following components?
1. The generator output terminal and the negative battery post
 2. The generator housing and the positive battery post
 3. The generator output terminal and the positive battery post or between the generator housing and the negative battery post
- 4-22. Which of the following conditions contributes to voltage drop in a circuit?
1. An open circuit
 2. Excessive resistance
 3. Low resistance
- 4-23. Excessive resistance in a vehicle's charging system can be caused by which of the following problems?
1. An open circuit
 2. Burned or oxidized cutout relay contacts only
 3. Loose or corroded connections only
 4. Burned or oxidized cutout relay contacts and loose or corroded connections
- 4-24. Which of the following tests is required to isolate the point of excessive resistance in a charging system?
1. An insulated circuit resistance test
 2. A battery drain test
 3. A charging circuit diode test
 4. An excessive output test
- 4-25. When you are performing a regulator ground circuit resistance test, a voltmeter reading exceeding how many volts indicates a possible damaged ground strap or loose mountings?
1. 0.1
 2. .01
 3. 1.0
 4. .02
- 4-26. A mechanic is measuring the resistance of an insulated circuit in an ac charging system. With the engine running at 2,000 rpm, the mechanic should increase the load with the tester until the ammeter reaches what reading?
1. 24 amperes
 2. 20 amperes
 3. 10 amperes
 4. 5 amperes

4-27. In a battery drain test, the ammeter scale reading is other than zero with all the vehicle's circuits turned off. What does this reading indicate?

1. An electrical short circuit
2. An electrical open circuit
3. A blown fuse
4. A corroded battery ground post

4-28. You can detect a single nonconducting diode in an alternator system by using which of the following devices?

1. A voltmeter
2. An analyzer screen
3. An ammeter
4. A microfarad meter

IN ANSWERING QUESTION 4-29, REFER TO FIGURE 4-18 IN YOUR TRAMAN.

4-29. When using the bypass device to test a charging system, which of the following steps should you take?

1. Operate the engine at idle
2. Race the engine briefly
3. Operate the engine at high speed for 1 minute
4. Bring the alternator to rated output

4-30. A shorted diode normally affects the alternator output more than an open diode for what reason?

1. A shorted diode opposes the following electrical pulse
2. A shorted diode will not conduct electricity
3. An open diode opposes the next pulse by allowing current to flow back through the winding

4-31. A weak diode will produce what type of pattern on an analyzer screen?

1. A high or low peak every sixth pulse
2. A flat signal each sixth pulse
3. A low ripple pattern
4. An abnormally high ripple pattern

4-32. After a defective alternator is removed for repair, how is the problem verified?

1. Using an oscilloscope
2. Using a simple ohmmeter
3. Using a voltmeter
4. By performing a resistance test

IN ANSWERING QUESTIONS 4-33 THROUGH 4-37, WHICH DEAL WITH TROUBLESHOOTING A VEHICLE'S STARTING SYSTEM WITH A BATTERY STARTER TESTER, REFER TO FIGURES 4-23 AND 4-27 IN YOUR TRAMAN.

4-33. When the battery starter tester is used for a quick overall test of a 12-volt starting system, which of the following tests should be performed?

1. Battery starter test
2. Starting motor current draw test
3. Cranking voltage test
4. Battery switch test

4-34. On a vehicle equipped with a 24-volt series-parallel starting system, what minimum voltmeter reading is considered normal for a cranking voltage test?

1. 18 volts
2. 16 volts
3. 12 volts
4. 8 volts

4-35. If the cranking voltage for a 12-volt system is 8 volts, you should take which of the following actions?

1. Test the battery capacity
2. Test the starter cranking current
3. Test the starter circuits
4. Each of the above

4-36. In a starting motor current draw test, the cranking speed of the motor is low and the current draw is normal. You should take which of the following actions?

1. Check the battery capacity
2. Check the starting circuit resistance
3. Check the starting motor cranking current

4-37. In tests where the engine is cranked with the ignition on, you should keep the engine from starting by connecting a jumper lead in what position?

1. Between the battery posts
2. Between the starting motor terminal and negative post of the battery
3. Between the secondary terminal of the coil and ground
4. Between the primary terminal of the coil and ground

IN ANSWERING QUESTION 4-38, REFER TO FIGURE 4-25 IN YOUR TRAMAN.

4-38. A starter insulated circuit resistance test is being performed on a 12-volt starting system. The voltage loss in each of the circuits shown in views A, B, and C should NOT exceed which of the following amounts?

1. 0.2, 0.3, and 0.4 volt, respectively
2. 0.4, 0.3, and 0.1 volt, respectively
3. 0.6, 0.5, and 0.4 volt, respectively
4. 0.2, 0.3, and 0.2 volt, respectively

4-39. During a starter ground circuit resistance test, the measured voltage loss exceeds 0.2 volt or the loss given by the manufacturer's specifications. This loss can result from which of the following problems?

1. A loose connection
2. A ground cable too small to carry the current
3. A dirty or corroded connection
4. Each of the above

4-40. High resistance in the solenoid switch circuit causes what to happen in the starting current?

1. Increased current flow
2. Reduced current flow
3. A voltage increase
4. A voltage decrease

4-41. While cranking the engine, you should place the leads of a voltmeter on the solenoid as shown in figure 4-27. What voltmeter reading, in volts, indicates excessive resistance?

1. .005
2. .05
3. 0.5
4. 5.0

4-42. At high engine speeds, which of the following drawbacks of the conventional ignition system is overcome by the transistorized ignition system (breaker point type)?

1. Incomplete saturation of the ignition coil only
2. Arcing across breaker points only
3. Incomplete saturation of the ignition coil and arcing across breaker points

- 4-43. What component of the magnetic-pulse transistor ignition system replaces the breaker plate assembly of the conventional ignition system?
1. An iron timer core
 2. A magnetic pickup assembly
 3. An ignition pulse amplifier
 4. A reluctor
- 4-44. What does the transistor in the amplifier of the magnetic-pulse transistor ignition system do?
1. It controls the current flowing between the coil primary and ground
 2. It desaturates the ignition coil
 3. It eliminates arcing across the breaker points
- 4-45. To help assure secondary voltage output during high engine speeds in a capacitor discharge system, which of the following components is connected across the primary windings of the coil?
1. An ignition pulse amplifier
 2. A high-voltage condenser
 3. A pickup coil
 4. An electronic control unit
- 4-46. Which of the following ignition system components is in a conventional system, as well as in an electronic (Chrysler) system?
1. A pickup coil
 2. An ignition coil
 3. A reluctor
 4. A condenser
- 4-47. The Chrysler electronic ignition uses a magnetic pickup coil and a rotating reluctor to replace which of the following components?
1. The cam and rubbing block
 2. The condenser
 3. The primary coil
 4. The rotor
- 4-48. On a Chrysler type of electronic ignition system, the compensating ballast resistor is bypassed for what reason?
1. To limit the voltage to the electronic control module
 2. To supply full voltage to ignition coil
 3. To reduce the primary voltage
 4. To raise the primary voltage
- 4-49. To adjust the air gap on the Chrysler electronic system, you align a reluctor tooth with the pickup coil tooth. You should then use a nonmagnetic gauge 0.002 larger than specified to obtain what tolerance?
1. Go no-go
 2. Loose
 3. Tight
 4. 0.002 inch
- 4-50. In the lean burn ignition system, the carburetor switch is used for what purpose?
1. To measure incoming fresh air temperature
 2. To signal the computer for more vacuum
 3. To signal the computer for a new throttle plate position
 4. To tell the computer the engine is either at idle or off idle
- 4-51. In a General Motors unitized ignition system, what part takes the place of the cam?
1. The pickup coil
 2. The timer coil
 3. The pole piece
 4. The rotor
- 4-52. In an HEI type of ignition system, what action occurs when the timer core teeth align with the pole piece?
1. Voltage is induced in the pickup winding
 2. Voltage is induced in the timer core
 3. The dwell period is shortened

- 4-53. In an HEI type of ignition system, what helps the firing of lean mixtures?
1. A shorter spark duration
 2. A longer spark duration
 3. Lower secondary voltage in the ignition coil
 4. Higher primary circuit voltage
- 4-54. Minicomputers are being used in many modern automotive ignition systems.
1. True
 2. False
- 4-55. In a computerized ignition system, ignition timing is performed by what assembly?
1. The distributor
 2. The processor
 3. The thermistor
 4. The E.G.R.
- 4-56. Altitude dependent EGR flow requirements are controlled by what sensor?
1. Coolant
 2. Barometer pressure
 3. Inlet air
 4. Manifold absolute pressure
- 4-57. Approximately what reference voltage is supplied to the coolant temperature?
1. 4 volts
 2. 6 volts
 3. 8 volts
 4. 12 volts
- 4-58. The ECA modifies engine timing to prevent spark knock at inlet air temperatures above what temperature?
1. 80°F
 2. 90°F
 3. 100°F
 4. 150°F
- 4-59. The throttle sensor is a rheostat connected to what part?
1. The position sensor
 2. The metal pulse ring
 3. The throttle plate shaft
- 4-60. When a distributorless ignition system is used, which of the following parts is/are eliminated?
1. The distributor itself
 2. The vacuum advance mechanism
 3. The mechanical advance mechanism
 4. All of the above
- 4-61. It would be better to test an ignition system with a scope tester for what reason?
1. It is more accurate
 2. It is less complicated
 3. You may do so with the engine running
 4. You can test the engine while it is hot
- 4-62. Of the following components, which is/are NOT a part of the secondary circuit of a conventional ignition system?
1. The spark plug wires
 2. The distributor cap
 3. The points
 4. The distributor rotor
- 4-63. In a conventional ignition system, excessive resistance may be a result of which of the following problems?
1. A defective spark plug
 2. A corroded distributor cap
 3. An unseated cable in the coil tower
 4. Each of the above
- 4-64. The condition of a standard ignition coil is satisfactory when the ohmmeter reads within what range?
1. 1,000 to 2,000 ohms
 2. 2,000 to 6,000 ohms
 3. 5,000 to 10,000 ohms
 4. 4,000 to 8,000 ohms

- 4-65. An ohmmeter can be used to indicate which of the following coil conditions?
1. An open secondary
 2. A bad connection at the coil terminal
 3. High resistance in the cable
 4. Each of the above
- 4-66. When you are testing a transistor ignition system, a reading of how many ohms resistance indicates a defective pickup coil?
1. 300 to 350
 2. 400 to 550
 3. 550 to 750
 4. 750 to 850
- 4-67. When you are removing a control unit connector of an electronic ignition system, the ignition switch must be in what position?
1. Off
 2. On
 3. Start
 4. ACC
- 4-68. Before conducting electrical testing on automotive or construction equipment, you should take which of the following actions?
1. Check the battery
 2. Check the battery connections
 3. Replace the battery
 4. Both 1 and 2 above
- 4-69. The unnecessary cutting of a wiring harness will cause what type of damage to occur?
1. It will allow moisture to enter the wiring harness
 2. It will cause loose connections
 3. It will make the system more complicated to troubleshoot
- 4-70. On automotive and construction vehicles, remotely mounted fuses may be found in which of the following locations?
1. Under the dashboard
 2. Under the hood
 3. Within the circuitry of the accessory
 4. All of the above
- 4-71. Fusible links are usually mounted close to what component on the electrical system?
1. The multiwire connector
 2. The battery
 3. The fuse block
 4. The alternator
- 4-72. Turn signal electrical wiring is somewhat complicated for which of the following reasons?
1. The brake light wiring must pass through the turn signal switch
 2. Turn signals and brake lights use the same bulbs
 3. The front signal lights are on a separate switch
- 4-73. Usually, before the signal switch can be removed from the equipment, you must take which of the following actions?
1. Disconnect the battery
 2. Remove the steering wheel
 3. Disconnect the multiwire connector
 4. Both 2 and 3 above
- 4-74. On a vehicle, brake light switches may be found in which of the following locations?
1. Under the dashboard
 2. on the master cylinder
 3. Mounted on the frame of the vehicle
 4. Each of the above

4-75. When troubleshooting a small electrical accessory motor, what should you check first?

1. The fuse
2. The mountings
3. The ground